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DEPT. OF EDUCATION
HISTORICAL COLLECTION

MATHEMATICS – SCIENCE

primary division – volume two

EDUCATIONAL TELEVISION SERIES 1967-68

Educational Television Branch
ONTARIO DEPARTMENT OF EDUCATION
1670 Bayview Avenue/Toronto 17

program schedule

MATHEMATICS—SCIENCE
primary

9 programs of 15 minutes each

PROGRAM NO.	CBC 9:30	CBC Repeat 9:30	CBOT 9:30	CHCH 9:30	CJOH CJSS 9:30	CKCO 9:30	CKCO Repeat 9:30
1	Oct. 19	Nov. 9	Oct. 19	Nov. 29	Nov. 22	Oct. 26	Nov. 16
2	Oct. 26	Nov. 16	Oct. 26	Dec. 6	Nov. 29	Nov. 2	Nov. 23
3	Nov. 2	Nov. 23	Nov. 2	Dec. 13	Dec. 6	Nov. 9	Nov. 30
4	Jan. 11	Feb. 1	Jan. 11	Dec. 20	Dec. 13	Jan. 18	Feb. 8
5	Jan. 18	Feb. 8	Jan. 18	Jan. 10	Dec. 20	Jan. 25	Feb. 15
6	Jan. 25	Feb. 15	Jan. 25	Jan. 17	Jan. 10	Feb. 1	Feb. 22
7	Mar. 28 (9:45)	Apr. 4 (9:45)	Apr. 10	Mar. 13 (9:45)	Mar. 6 (9:45)	Apr. 4 (9:45)	Apr. 11 (9:45)
8	Apr. 11 (9:45)	Apr. 18 (9:45)	Apr. 17	Mar. 27 (9:45)	Mar. 13 (9:45)	Apr. 18 (9:45)	Apr. 25 (9:45)
9	Apr. 25 (9:45)	May 2 (9:45)	Apr. 24	Apr. 3 (9:45)	Mar. 27 (9:45)	May 2 (9:45)	May 9 (9:45)

MATHEMATICS-SCIENCE

6 programs of 15 minutes each for primary students
This is volume 2 of a two-volume series. Programs 1, 2 and 3 were contained in Volume 1.

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Series produced by:
PEGGY LIPTROTT

general introduction - Familiar Things in the Kitchen

This section of the Mathematics-Science series consists of three programs for the primary grades with special suitability for the first-year level. However, they can be applicable at the kindergarten, second and third-year levels.

The series has one major aim: to encourage classes to experiment and to make inquiries on their own. No attempt has been made to teach specific facts. In each of the programs many questions are implied, often by the actions of the children. If stated, the questions are left unanswered. Those questions which are noted by the individual classes could serve as starting points for discussions or for the development of interest.

For some children in each classroom, the acts themselves of popping corn, dropping drops or making jelly will be sufficient. They need time to assimilate these experiences because often children are not able to show any indication of what these experiences have meant to them until much later.

It is hoped that each program will be a stimulus toward varied and interesting work in the classroom.

These three programs are experimental in nature. In them the children's words and actions are their own, because there was a minimum of rehearsal time.

In the first and third programs, which deal with popcorn and jelly, four primary school children are seen at work with these materials. A puppet makes suggestions; the children's activities and remarks are in response to the puppet. These programs were produced in a studio.

In the second program, the children are on their own without the puppet or a teacher. Their activities stem from their own interest in the many things which happen when drops of paint fall on a piece of paper. Before the filming, which took place in the classroom, their teacher, Miss Tokiwa, gave them a few suggestions. The program shows the children in unrehearsed situations.

The ETV Branch is anxious to hear from teachers concerning the experimental aspects of these programs. Are children interested in seeing other children on the TV screen? How do children viewing the programs respond to situations placed in classroom settings? Is there value in a program which is planned so that children are free to follow their own lines of activity and speech? Should children be put in front of a camera without having previously memorized speeches and actions? To what extent are these programs successful in encouraging children to try for themselves? Are programs of this nature useful in the development of *your* curriculum?

Comments on these programs will be of great value in determining lines to be followed on future programs. Please send them to the ETV Branch, 1670 Bayview Avenue, Toronto 17, Ontario.

Suggested Reading:

1. Interim Revision Science (P_1J_1): Preamble, Introduction and "Observing Familiar Things". pp. 1-6.
2. Interim Revision Science: Appendix B, Case History in the Nuffield Science Project, pp. 22-28.
3. Kindergarten: Activity Time, pp. 17-21.

program four

POPCORN

The purpose of this program is to encourage children to discover the changes which occur when popcorn is popped.

PROGRAM CONTENT

"Elfie", a puppet, is shown buying popcorn from a street vendor. Later four children, Mirko, Alan, Mary, Margaret, and "Elfie" make popcorn using longhandled poppers and electric hot-plates. The children discuss briefly the appearance and the feel of the unpopped kernels. Some attempt is made to measure definite amounts of corn into the poppers. While the corn is popping, the children comment on what they see and hear. Although the puppet tries several times to have the children discuss the difference between popped and unpopped corn, their main concern at this point is to prepare the popcorn for eating. Accordingly, butter and salt are added and the children sample the popped corn.

SUGGESTED PRE-VIEWING ACTIVITIES

1. Hold a general class discussion on popcorn.
2. Examine the kernels of popping corn, using the senses of touch, sight, taste, and smell.
3. Discuss various ways of measuring the corn, ranging from a handful to definite units of measure.

SUGGESTED POST-VIEWING

1. Compare popped and unpopped corn with particular reference to the differences in volume.
2. Through discussion, encourage the children to pursue their own investigations. Some of the children may become interested in finding out whether other foods or materials act the same way when heated. Some may develop an interest in smells. Some may become interested in sounds and the various ways they may be produced. Some may want to observe a popcorn vending machine closely and find out how it works. Some may wish to build a store to sell popcorn while last, but not least, the children will probably want to share the experience of eating popcorn with their classmates.

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program five

DROPS

The purpose of this program is to encourage children to discover for themselves that the shapes which drops make on a paper are different because, of the distance the drops must fall, the position, and the type of paper which was used.

PROGRAM CONTENT

The program opens by showing raindrops on a window-pane, drops from a lawn sprinkler, and from a tap.

Viewers then see children in a classroom freely experimenting by using coloured water drops from eye droppers and small brushes on various kinds of paper—newsprint, kleenex tissue, blotting paper, and waxed paper—and watching what happens to them. Later in the program, a basin of sand is also used. The children try dropping the drops from various heights—from sitting and standing positions on the floor, and standing on chairs—and on level and inclined planes. Many of the comments the children made as they experimented with the drops cannot be heard clearly. However, it is anticipated that the children who are viewing the program will make their own comments as they watch. No attempt has been made to come to any conclusions.

At the end of the program, some of the children are shown recording things which they each found interesting or significant.

SUGGESTED PRE-VIEWING ACTIVITIES

1. Have the children experiment with water to discover its properties.
2. Discuss the many kinds of drops in the world the child knows.

SUGGESTED POST-VIEWING ACTIVITIES

1. Compare sizes of drops which are dropped from different heights.
2. Compare drops on different kinds of paper.
3. Such comparisons may lead in some cases to simple graphs.
4. Use other liquids for producing drops.
5. Talk about the shapes of the drops and the designs produced by them. This may interest some children and encourage them to continue their experimentations along artistic lines.
6. Have some children experiment with the effect of drops on soil, and in telling the rest of the class about their discoveries.
7. Find other ways of making drops, such as those from a dripping faucet.

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program six

JELLY

The purpose of this program is to encourage children to observe the changes which take place after some fluid materials are poured into moulds.

PROGRAM CONTENT

The four children, Mary, Margaret, Alan, and Mirko, along with "Elfie", the puppet, examine briefly the gelatin granules under a magnifying glass before they actually make the jelly. They use a simple chart to help them with the directions. After the material has been poured into individual moulds and put into the refrigerator, the children watch two short films. Both show how materials can become fluid in nature, then solid again. The first film shows concrete being poured into rectangular moulds,

then the moulds are removed when the concrete has hardened. The other film shows plastic being forced through tubes and the finished product, waste baskets.

After the film, the four children and "Elfie" discuss how long it takes for jelly to harden. Jelly, prepared previously, is given to the children to cut and eat.

SUGGESTED PRE-VIEWING ACTIVITIES

1. Let the children talk about the materials needed in the making of jelly. They may wish to bring packages of jelly powder. If so, the children may group the packages of jelly into sets according to colour or flavour.
2. If the children bring various moulds and containers, these may lead to a discussion of shapes and sizes.
3. Comparison of sizes could lead the children to find various ways of measuring the containers—e.g. by height, by circumference, by diameter, by weight, etc.

SUGGESTED POST-VIEWING ACTIVITIES

1. Have the children make jelly. Although the jelly in the program was taken out of the moulds beforehand, the children might like to do this with the help of the teacher in the classroom.
2. Have the children compare the shapes of the unmoulded jelly and the containers from which they were taken.
3. Class discussion and projects may develop along many lines, including:
   - — some shapes in the world around the children,
   - — the feel of jelly to the touch,
   - — the question of whether jelly is a liquid or a solid,
   - — the way in which jelly can be cut evenly into halves and quarters. This may lead to an interest in the symmetry of objects.
4. Encourage the children to talk about concrete and plastics.

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general introduction - Seeds and Growth

This section of the Mathematics-Science series consists of three programs based upon the unit "Seed Growth" recommended for the pupils of the third year (see P1, J1, Interim Science). Although these programs are directed at the upper primary division, they can be applicable at the kindergarten, first and second year levels.

The prime objectives of the series are:

— to help develop the ability to predict and verify over a period of time;

— to provide experience in interpreting mathematical symbols in a practical and realistic situation;

— to gain through the study of seeds a knowledge of how plants grow;

— to realize the basic needs of plant growth;

— to provide an opportunity for pupil involvement not only through the study of seeds, but also through the mathematical activities which follow as a result of this study.

The first two programs of the series follow one class as it divides into groups to study seeds and seed growth. The children in the classroom are unrehearsed and their activities stem from their own interest. The third program takes us out of the classroom so that a study can be made of the importance of seeds and their value to us.

It is hoped that Program 1 will motivate the children who are viewing the programs to plant seeds of their own so that they will be able to compare what they did with the television class.

program seven

SEEDS FOR PLANTING

The purpose of this program is to stimulate the interest of the children in examining and planting seeds.

PROGRAM CONTENT

A class of grade 3 children, pupils of Miss Donna Gowans, Norwood Park School, Hamilton, are seen in small groups in the classroom examining and planting seeds. At various times during the program one child at each activity centre is asked to describe what his group is doing. In sequence we will see the following activities:

— children looking at a variety of seeds and noting their similarities and differences

— children sorting and classifying seeds as to colour and size

— children counting and measuring seeds

— children weighing the seeds

— children painting and making creative designs with seeds

— children filling containers with soil and planting the seeds

— children labelling the various containers

At the end of the program, some of the children are shown recording what each found interesting or significant.

SUGGESTED PRE-VIEWING ACTIVITIES

The children could be given a variety of seeds before the telecast so that they can sort and classify their seeds. Then viewing children will be able to compare what they have done with the television class.

SUGGESTED POST-VIEWING ACTIVITIES

1. A discussion of the program:
   — what did children on the screen do with their seeds?
   — did the television class do anything that was new or different?
2. In preparation for the children planting seeds:
   — Make a collection of various types of containers (e.g. pots, wooden boxes, plastic cups, glass jars) for planting.
   — If the children have not already brought seeds to school, have them select a committee to go to the local store to buy seeds. Prior to this, the class could discuss such things as the types and sizes of seeds to buy, and the length of germination.
   — Have the children fill their containers with soil. This should give them interesting practice in estimating and comparing volumes of different shaped containers.
3. Prior to actually planting the seeds, review the activities of the television class in planting their seeds.

program eight

THE GROWTH OF SEEDS

The purpose of this program is to show how children can observe, measure and compare the growth stages of seedlings.

PROGRAM CONTENT

In this program, we see the seeds that the children planted in Program 1 at various stages of growth. The television children carry out the following activities:

— digging up some of the seedlings and comparing their rate of growth

— measuring the roots, stems and leaves of the various plants

— mounting the seedlings on large sheets of paper

— painting and drawing the various seedlings

— making graphs

During the program, several children will be asked to describe the activity in which they are engaged.

SUGGESTED PRE-VIEWING ACTIVITIES

1. After seeing the first program, classes who have planted their own seeds might review briefly what they have done and learned. The children can then compare the growth of their own seedlings with those of the television class.
2. For other classes, it might be useful to have a brief discussion on what the television class has already done and what you think they might do with their seedlings in this program.

SUGGESTED POST-VIEWING ACTIVITIES

1. The children could engage in some of the activities seen in the program.
2. A brief discussion on which plants grew the best and the reasons for this (e.g. amount of water and soil, temperature, sunlight) would be valuable in pointing out the needs of seed growth.
3. The children might give an oral or written report on their own activities.
4. The children might wish to plant seeds around the school in order to add beauty to their surroundings.
5. The children might find it both interesting and worthwhile to make a visit to a farm during seeding.

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program nine

THE USES OF SEEDS

The purpose of the program is to make the children more aware of the importance of seeds in fulfilling the needs of man and animal.

PROGRAM CONTENT

Through the use of film footage, the children will see how man has made use of seeds to provide food, fibre, shelter, fuel, recreation and beauty. For each of the above, only one or two examples will be given. It is hoped, by viewing the program, that the children will be motivated into further research and enquiry of their own.

SUGGESTED PRE-VIEWING ACTIVITIES

In preparation for the program, there could be a brief discussion as to the value and uses of seeds to man and animal. The children could then list their ideas and perhaps add to it during the telecast.

SUGGESTED POST-VIEWING ACTIVITIES

1. Plan a visit to a greenhouse to see how seeds give rise to new plants.
2. Further research could be done on how seeds help us.
3. A field trip to a stream would enable children to see how trees and undergrowth prevent erosion.
4. Suggest that the children collect pictures showing how seeds help us.
5. Have the children bring samples of wood, cloth, and fruit which come from seeds.
6. Continue measuring and comparing their seedlings and graphing the results.

FOR OPTIMUM VIEWING CONDITIONS

1. Review Teacher's Guide well in advance of each telecast.

2. Have the set on and adjusted, sound off, prior to telecast.

3. Assure student comfort
   - — located for best viewing
   - — no glare, reflection on screen
   - — room properly ventilated
   - — suggested materials ready
   - — within maximum of 20′ of the screen

4. Seat yourself where you can observe both the telecast and your students' reactions.

This diagram shows the suggested placement of the television set: